

General Purpose Transistors

NPN Silicon

**BC846ALT1,BLT1
BC847ALT1,BLT1
CLT1 thru
BC850BLT1,CLT1**

MAXIMUM RATINGS

Rating	Symbol	BC847 BC848			Unit
		BC846	BC850	BC849	
Collector–Emitter Voltage	V_{CEO}	65	45	30	V
Collector–Base Voltage	V_{CBO}	80	50	30	V
Emitter–Base Voltage	V_{EBO}	6.0	6.0	5.0	V
Collector Current — Continuous	I_C	100	100	100	mAdc
Collector Current(Peak value)	I_{CM}	200	200	200	mAdc
Emitter Current(Peak value)	I_{EM}	200	200	200	mAdc
Base Current(Peak value)	I_{BM}	200	200	200	mAdc

SOLDERING CHARACTERISTICS

Characteristic	Symbol	Unit
Solder Heat Resistance	265	°C
Solderability	240 to 265	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR– 5 Board, (1) $T_A = 25^\circ\text{C}$	P_D	225	mW
Derate above 25°C		1.8	mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	°C/W
Total Device Dissipation Alumina Substrate, (2) $T_A = 25^\circ\text{C}$	P_D	300	mW
Derate above 25°C		2.4	mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	°C/W
Junction and Storage Temperature	T_J, T_{stg}	–55 to +150	°C

DEVICE MARKING

BC846ALT1 = 1A; BC846BLT1 = 1B; BC847ALT1 = 1E; BC847BLT1 = 1F;
BC847CLT1 = 1G; BC848ALT1 = 1J; BC848BLT1 = 1K; BC848CLT1 = 1L

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

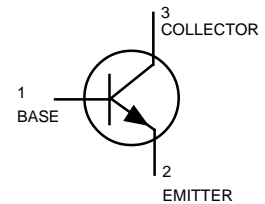
Collector–Emitter Breakdown Voltage ($I_C = 10\text{ mA}$)	BC846A,B	65	—	—	
	BC847A,B,C, BC850B,C	$V_{(BR)CEO}$	45	—	v
	BC848A,B,C, BC849B,C		30	—	—
Collector–Emitter Breakdown Voltage ($I_C = 10\text{ }\mu\text{A}$, $V_{EB} = 0$)	BC846A,B	80	—	—	
	BC847A,B,C, BC850B,C	$V_{(BR)CES}$	50	—	v
	BC848A,B,C, BC849B,C		30	—	—
Collector–Base Breakdown Voltage ($I_C = 10\text{ }\mu\text{A}$)	BC846A,B	80	—	—	
	BC847A,B,C, BC850B,C	$V_{(BR)CBO}$	50	—	v
	BC848A,B,C, BC849B,C		30	—	—
Emitter–Base Breakdown Voltage ($I_E = 1.0\text{ }\mu\text{A}$)	BC846A,B BC847A,B,C	6.0	—	—	
	BC848A,B,C, BC849B,C,	$V_{(BR)EBO}$	5.0	—	
	BC850B,C		5.0	—	
Collector Cutoff Current ($V_{CB} = 30\text{ V}$) ($V_{CB} = 30\text{ V}$, $T_A = 150^\circ\text{C}$)		I_{CBO}	—	15	nA
			—	5.0	μA

1. FR–5 = 1.0 x 0.75 x 0.062 in

2. Alumina = 0.4 x 0.3 x 0.024 in, 99.5% alumina.



CASE 318–08, STYLE 6
SOT–23 (TO–236AB)



BC846ALT1,BLT1 BC847ALT1,BLT1 CLT1 thru BC850BLT1,CLT1

ELECTRICAL CHARACTERISTICS($T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
DC Current Gain ($I_C = 10\ \mu\text{A}$, $V_{CE} = 5.0\ \text{V}$)	BC846A, BC847A, BC848A	h_{FE}	—	90	—
	BC846B, BC847B, BC848B		—	150	—
	BC847C, BC848C		—	270	—
($I_C = 2.0\ \text{mA}$, $V_{CE} = 5.0\ \text{V}$)	BC846A, BC847A, BC848A		110	180	220
	BC846B, BC847B, BC848B, BC849B, BC850B		200	290	450
	BC847C, BC848C, BC849C, BC850C		420	520	800
Collector–Emitter Saturation Voltage ($I_C = 10\ \text{mA}$, $I_B = 0.5\ \text{mA}$) ($I_C = 100\ \text{mA}$, $I_B = 5.0\ \text{mA}$)	$V_{CE(sat)}$	—	—	0.25 0.6	V
Base–Emitter Saturation Voltage ($I_C = 10\ \text{mA}$, $I_B = 0.5\ \text{mA}$) ($I_C = 100\ \text{mA}$, $I_B = 5.0\ \text{mA}$)	$V_{BE(sat)}$	—	0.7 0.9	—	V
Base–Emitter Voltage ($I_C = 2.0\ \text{mA}$, $V_{CE} = 5.0\ \text{V}$) ($I_C = 10\ \text{mA}$, $V_{CE} = 5.0\ \text{V}$)	$V_{BE(on)}$	580	660	700 770	mV

SMALL–SIGNAL CHARACTERISTICS

Current–Gain — Bandwidth Product ($I_C = 10\ \text{mA}$, $V_{CE} = 5.0\ \text{Vdc}$, $f = 100\ \text{MHz}$)	f_T	100	—	—	MHz
Output Capacitance ($V_{CB} = 10\ \text{V}$, $f = 1.0\ \text{MHz}$)	C_{obo}	—	—	4.5	pF
Noise Figure ($I_C = 0.2\ \text{mA}$, BC846A, BC847A, BC848A $V_{CE} = 5.0\ \text{Vdc}$, $R_S = 2.0\ \text{k}\Omega$, BC846B, BC847B, BC848B $f = 1.0\ \text{kHz}$, BW = 200 Hz) BC847C, BC848C BC849B,C, BC850B,C	NF	—	—	10 4.0	dB

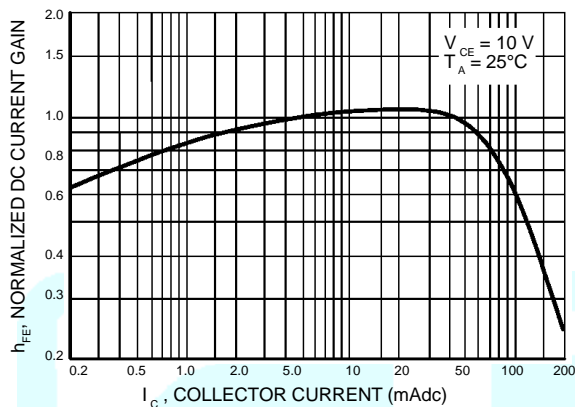


Figure 1. Normalized DC Current Gain

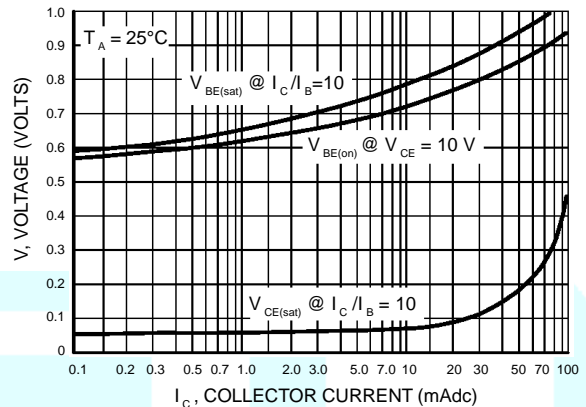


Figure 2. "Saturation" and "On" Voltages

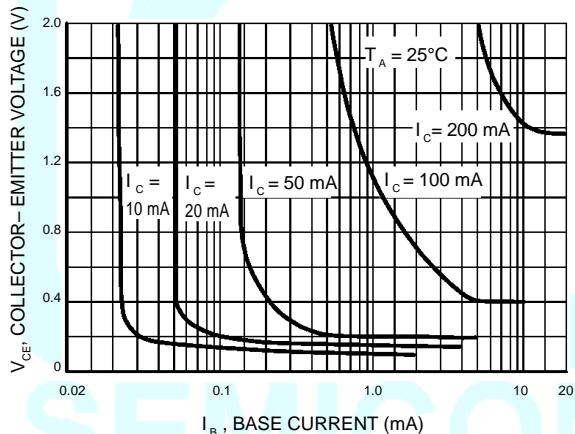


Figure 3. Collector Saturation Region

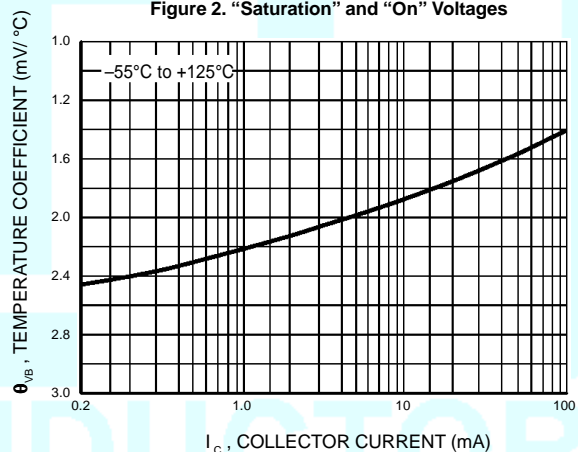


Figure 4. Base–Emitter Temperature Coefficient

BC846ALT1,BLT1 BC847ALT1,BLT1 CLT1 thru BC850BLT1,CLT1

BC847/BC848

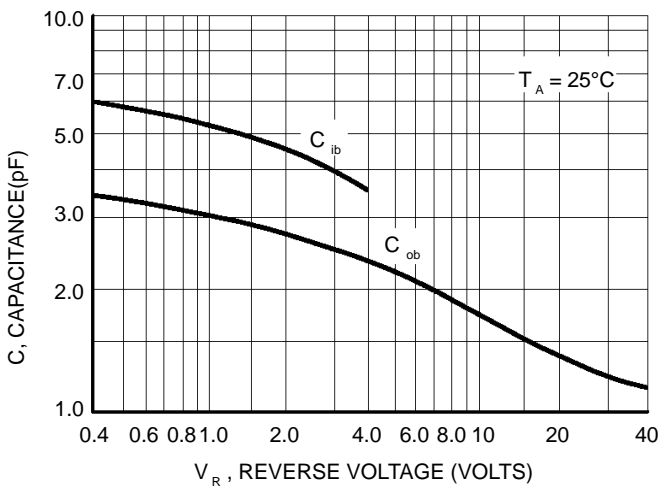


Figure 5. Capacitances

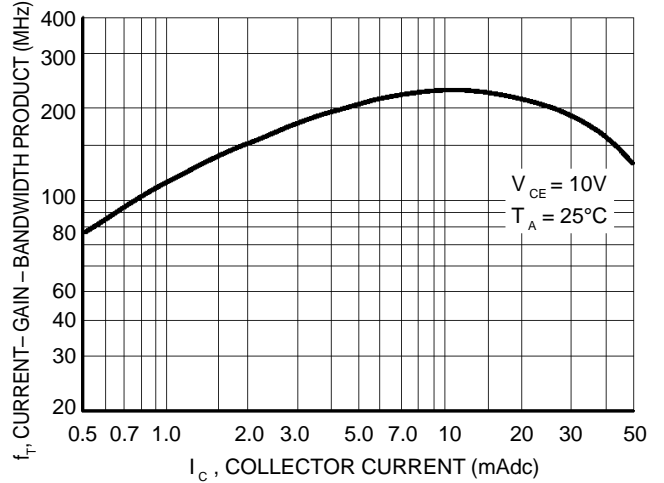


Figure 6. Current-Gain - Bandwidth Product

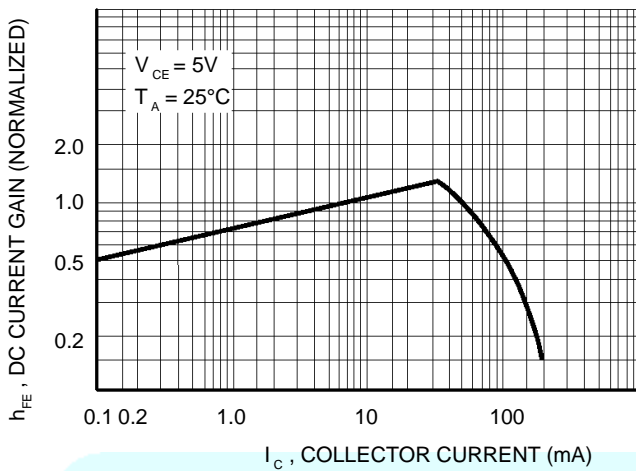


Figure 7. DC Current Gain

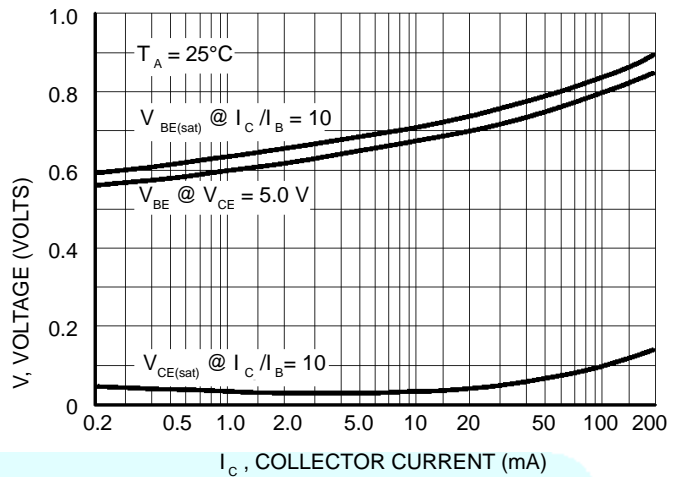


Figure 8. "On" Voltage

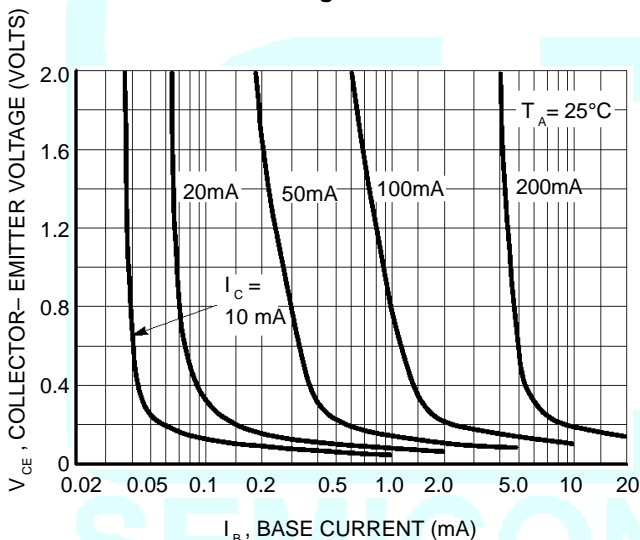


Figure 9. Collector Saturation Region

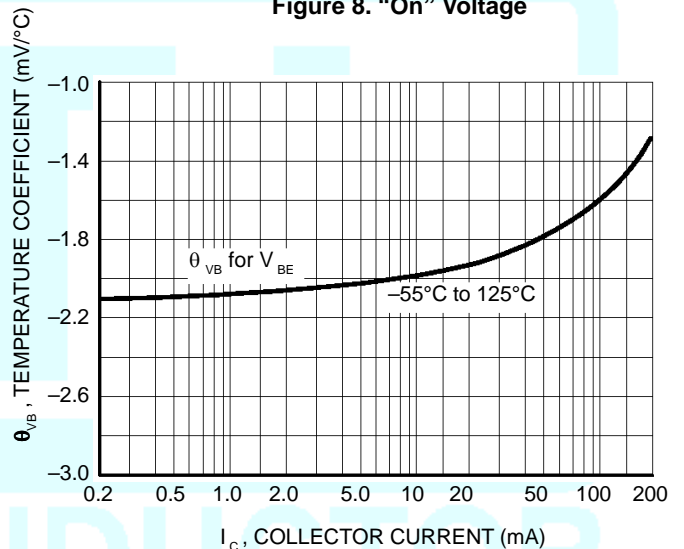


Figure 10. Base-Emitter Temperature Coefficient

BC846ALT1, BLT1 BC847ALT1, BLT1 CLT1 thru BC850BLT1, CLT1

BC846

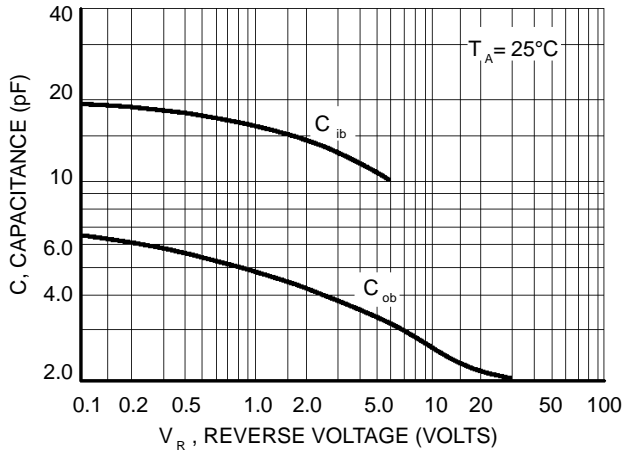


Figure 11. Capacitance

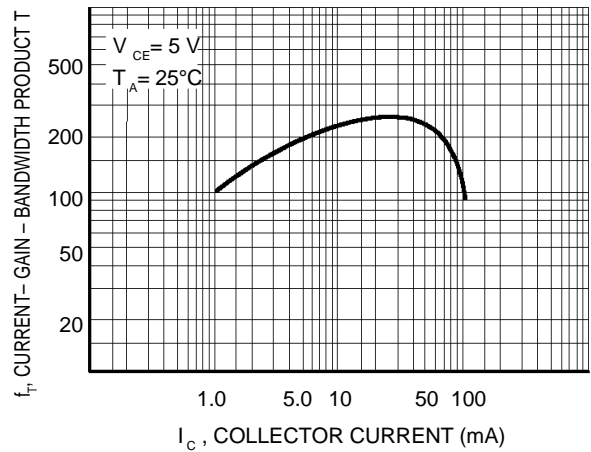


Figure 12. Current-Gain - Bandwidth Product